



ENERGY STAR® Set-top Box Program
Draft Specification
Version 3.0
March 29, 2000



The symbol for energy efficiency.

Below is the revised draft product specification for the ENERGY STAR Set-top Box Program. Per the requirements of the ENERGY STAR Program, a product must meet all of the identified criteria if it is to be qualified as ENERGY STAR compliant by its manufacturer.

- 1) Definitions: Below is a brief description of a set-top box and its common operational modes as relevant to the ENERGY STAR Program. The ENERGY STAR specification focuses on reducing energy consumption while the product is in the Standby/Low-power Mode.
 - A. Set-top Box: A commercially available electronic product encased in a single housing whose purpose is to receive, send, process, translate, and/or record signals that are then sent to a television or similar display device for viewing or to a computer for processing. Products currently covered under the TV/VCR and Home Audio/DVD Memoranda of Understanding (MOUs) are not eligible to qualify for the ENERGY STAR label under the Set-top Box Program. As the TV/VCR and Home Audio/DVD specifications are revised, EPA will make a concerted effort to coordinate and/or consolidate, as appropriate, the energy-efficiency specifications across the TV/VCR, Home Audio/DVD, and Set-top Box Programs.
 - B. Standby/Low-power Mode: The lowest power state that the set-top box product model enters while connected to a power source. In this mode, the product appears to be “OFF” to the user, but may be capable of responding to a signal (e.g., a signal sent from a head end or data provider) and may continue to perform some functions (e.g., remote control sensing, time readout, and hard drive spinning). If the product is designed for a network environment, then it must retain network connectivity (e.g., communication with a head end or service provider) and the ability to wake up from a remote source in the standby/low-power mode. The manufacturer must ensure that the energy-saving features or design of the ENERGY STAR-compliant product do not interfere with or adversely impact the performance of the product.

EPA Comments: Please note that the Standby/Low-power Mode defined above differs from the Standby Mode defined for the TV/VCR and Home Audio/DVD Programs. According to industry, the “traditional” Standby Mode provided in the TV/VCR and Home Audio/DVD Programs is not currently applicable to all types of set-top boxes. Hence, the Standby/Low-power Mode definition is fairly general and does not dictate product requirements in recognition that different boxes may perform different functions when turned “OFF.” For additional information, please refer to the EPA Comment Box following Definitions on page 2.

- C. Active Mode: The mode in which the product has been turned “ON” by the user. The product is connected to a power source and is receiving, sending, processing, translating, and/or recording signals. The power requirement in this mode is typically greater than the power requirement in standby/low-power mode.
 - D. Disconnect: The mode in which the product is disconnected from all external power sources.

EPA Comments: Above are brief descriptions of common operational modes for set-top boxes that EPA has observed in field tests conducted by/for EPA. To achieve the maximum energy savings without compromising performance, the ENERGY STAR specification will focus on standby/low-power mode, which was the consensus at the July 1999 meeting between EPA and set-top box industry representatives. (See www.energystar.gov for list of attendees.) EPA has purposefully avoided defining various standby/low-power modes based on the functionality provided in each mode (e.g., standby-passive, standby-active, etc.) for two reasons: 1) recognition of the variation in modes and functionality across product categories, and 2) desire to encourage simplicity in program design and implementation.

In Version 3.0 of the Draft Specification, minor modifications have been made to the set-top box and active mode definitions.

- 2) Qualifying Products: For the purposes of this Program, set-top box products include the following: analog cable TV set-top boxes, advanced analog cable TV set-top boxes, digital TV converter set-top boxes, Internet access devices, video game consoles, videophone set-top boxes, set-top boxes with cable modems, digital cable TV set-top boxes, satellite TV set-top boxes, wireless TV set-top boxes (e.g., MMDS and LMDS), and personal video recorders (e.g., TiVo and Replay TV) and multimedia devices (i.e., terminals that offer new and enhanced services through the convergence of telecommunications, Internet, satellite, and digital electronics) with hard drive video recording functionality. Combination set-top box products with two or more functions may also qualify for the label under this Program.

EPA Comments: EPA's interest in developing energy-efficiency guidelines for set-top boxes is driven by the following factors: 1) the identification of products with a large and growing installed base; 2) expectations of significant market growth; 3) evidence of considerable energy use by these products when consumers believe they are off; 4) the potential for more energy-efficient design that does not compromise performance, based on engineering analysis and manufacturer feedback; and 5) changing distribution and usage patterns that will provide consumers with more opportunities to choose energy-efficient models.

Given that these products share many common design characteristics and it is administratively more efficient to maintain one versus several ENERGY STAR Programs, EPA intends to cover a variety of products under one Set-top Box Program.

In Version 3.0 of the Draft Specification, the qualifying product list has been revised to include wireless TV set-top boxes (e.g., MMDS and LMDS).

- 3) Energy-Efficiency Specifications for Qualifying Products: Only those products listed in Section 2 that meet the specifications outlined in Table 1 below may qualify as ENERGY STAR compliant. For combination products with two or more functions, manufacturers should identify the most energy-intensive function and then qualify the combination product under the category below that best describes the function. For example, a combination product with DBS and digital TV converter capabilities would be required to meet the 15-Watt specification as opposed to the 3-Watt specification.

Table 1: DRAFT Energy-Efficiency Criteria for ENERGY STAR–compliant Set-top Boxes

Product Category	Tier 1: Standby/Low-power Mode	Tier 2: Standby/Low-power Mode
Category 1 <ul style="list-style-type: none"> Analog Cable TV Set-top Box Advanced Analog Cable TV Set-top Box Digital TV Converter Set-top Box Internet Access Device Video Game Console Videophone Set-top Box Set-top Box (e.g., Internet access device) with Cable Modem for enhanced communications in standby/low-power mode 	≤ 3 Watts	One specification for all set-top boxes:
Category 2 <ul style="list-style-type: none"> Digital Cable TV Set-top Box Satellite TV Set-top Box Wireless TV Set-top Box Personal Video Recorder Multimedia Device (i.e., terminal that offers new and enhanced services through the convergence of telecommunications, Internet, satellite, and digital electronics) with Hard Drive Video Recording Functionality 	≤ 15 Watts (including antenna in satellite systems)	≤ 7 Watts (including antenna in satellite systems)

***EPA Comments:** Version 3.0 of the Draft Specification includes a number of significant revisions based on industry comments and suggestions. Specifically, EPA has made the following additions and modifications:*

- The 8-Watt and 12-Watt specifications proposed in Version 2.0 have been replaced with a 15-Watt specification for digital cable TV set-top boxes, satellite TV set-top boxes, wireless TV set-top boxes, personal video recorders, and multimedia devices with hard drive video recording functionality. The proposed 15-Watt specification is consistent with the new ENERGY STAR Computer Program specification that takes effect on July 1, 2000;*
- The antenna is included in power calculations for satellite TV set-top boxes. Several industry representatives encouraged EPA to include the antenna in the specification because the antenna is an integral part of the satellite system and its power consumption; and*
- A Tier 2 specification of 7 Watts for all product categories has been developed. EPA proposes that the Tier 2 specification take effect approximately three years after Tier 1 commences. As product convergence continues, EPA believes that it will be both desirable and necessary to develop one specification for all set-top boxes. Further, EPA feels that developing a Tier 2 specification well in advance of its implementation date provides the following advantages: 1) it allows manufacturers to make long-term energy-efficiency design decisions with confidence that the specification won't change shortly thereafter, and 2) it reduces the administrative burden on both EPA and manufacturers because fewer industry meetings and written agreements are required.*

Please note that the primary objective of the ENERGY STAR Programs is to recognize the most energy-efficient products in the market through the use of the ENERGY STAR label—a label well known by consumers and large purchasers as the symbol for energy efficiency. It is not EPA's intention to design a specification that will allow every model to qualify for the label. EPA believes that this draft specification will recognize a reasonable sub-set of the marketplace.

- 4) Power Measurement: The power requirement shall be measured from the outlet or power supply source to the product under test. The product manufacturer (i.e., ENERGY STAR Partner) shall measure the average true power (in Watts) of the product. When performing measurements to self-certify a product model, the products under test must be in the condition (e.g., configuration and settings) shipped to the customer. In addition, if a product is designed for a network environment, it must be tested while connected to the network to ensure that all power consumption and performance criteria are met. The test method to be used by manufacturers to self-certify their product(s) for ENERGY STAR compliance will likely be consistent with the Testing Guidelines for the ENERGY STAR® Home Electronics Program. Manufacturers are invited to provide comments and/or suggestions on the test method.

EPA Comments: The draft Test Method is attached for your review and comment. Please note that the time period for testing an individual device is based on the power consumption profile in Standby/Low-power Mode. Example: If the device under test has modes that put it in a low-power state for 4 hours and a higher power state for 1 hour, then an average over 5 hours will be sufficient to capture the true average power consumption of the device.

- 5) Other Information: The *final* version of the ENERGY STAR set-top box specification will be provided in the standard Memorandum of Understanding (MOU) format. In addition to the product specifications, other issues will be addressed such as the following.
- Buyer Information: In keeping with the spirit of the ENERGY STAR Program, the Partner will be expected to ensure that consumers have a quick and easy method of determining which of its products are ENERGY STAR compliant. To achieve this goal, EPA recommends that the Partner place the ENERGY STAR logo on all qualified product models, their packaging, and product-related materials such as brochures, manuals, advertisements, and Web sites. Further, to educate consumers about energy efficiency and its benefits, the Partner will provide one or more of the following: a description of the ENERGY STAR Program, a discussion of the energy-saving characteristics of the product, a description of the environmental benefits that result from the energy saved by the product, and/or a description of the potential energy-bill savings of the product. The Partner may determine the best manner to disseminate this educational information to customers (e.g., Web sites and brochures) such that it complements the Partner's existing strategy for promotional and informational materials. For example, one manufacturer included the following text in a recent product brochure:

“Even when your televisions are “off” they drain power. According to the U.S. Environmental Protection Agency, an ENERGY STAR–labeled TV consumes up to 75% less energy than the average TV when switched off. The ENERGY STAR label, a symbol for energy efficiency, was created by the U.S. Department of Energy and the U.S. Environmental Protection Agency to help identify products that can save money and protect the environment by saving energy.”

Upon request, EPA will review text prepared by Partners to ensure accuracy prior to printing and/or distribution.

- Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR compliant will be defined as the *effective date* of the MOU.

1. Tier 1

The first phase of this program, Tier 1, shall commence immediately (when the specification is finalized in late May 2000) and conclude on December 31, 2003. Upon signing the MOU, the Partner may begin to use the ENERGY STAR logo on product models, packaging, or other product-related materials that meet Tier 1 specifications. Marketing and promotional activities in support of this program (e.g., program launch) will be conducted by EPA, with assistance from Partners and the Electronics Industry Alliance/Consumer Electronics Association (EIA/CEA), at the 2001 Consumer Electronics Show (CES[®]).

2. Tier 2

The second phase of this program, Tier 2, shall commence on January 1, 2004. Specifications for Tier 2 shall apply to products that the Partner begins to ship after December 31, 2003. However, once an individual product model is qualified by the Partner as ENERGY STAR compliant, the model, packaging, or other product-related materials may continue to bear the ENERGY STAR logo until the model is phased out of the market (i.e., the Tier 2 specifications will not apply retroactively to models previously qualified under Tier 1 specifications).

- Future Specification Revisions: EPA reserves the right to change the specifications should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specifications are arrived at through industry discussions.

EPA Comments: In order to focus EPA/industry discussions on the most crucial elements of the Program (i.e., the definitions and energy-efficiency criteria), EPA has provided this brief draft specification as opposed to a complete agreement. However, the draft and final versions of the agreement will have many of the standard sections of an ENERGY STAR agreement.

As always, EPA welcomes comments or alternative proposals from industry that address the issues in this Draft Specification. EPA deems industry feedback crucial to the successful development of ENERGY STAR Programs.